

Economic | STRATEGY | Institute

April 13, 1998

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
Room 222
1919 M Street
Washington, DC 20005

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Dear Ms. Roman Salas:

We hereby present the Comments of the Economic Strategy Institute in the matter of the petition of Rulemaking 98-44, Petition of the Alliance for Public Technology Requesting Issuance of a Notice of Inquiry And Notice of Proposed Rulemaking to Implement Section 706 of the 1996 Telecommunications Act.

Enclosed are one (1) original and eleven (11) copies of these comments for submission to these proceedings. We are also submitting twelve (12) copies of an attachment, "America's Broadband Future" conference proceedings.

Sincerely,



Erik R. Olbeter
Director, atitp@ESI

Enclosures

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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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APR 13 1998

FEDERAL COMMUNICATIONS COMMISSION
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In the Matter of

Petition of the Alliance for Public Technology)
Requesting Issuance of a Notice of Inquiry) RM 92-44
And Notice of Proposed Rulemaking to)
Implement Section 706 of the 1996)
Telecommunications Act)

COMMENTS OF THE
ECONOMIC STRATEGY INSTITUTE

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April 13, 1998

Table of Contents

SUMMARY AND INTRODUCTION.....	3
THE IMPORTANCE OF BROADBAND TECHNOLOGIES.....	7
THE COMMISSION’S POLICIES DO IMPACT INVESTMENT DECISIONS AND THE COMMISSION MUST TAKE ACTION TO SPUR INVESTMENT IN BROADBAND NETWORKS AND APPLICATIONS.....	11
SPECIFIC COMMENTS ON THE APT PETITION AND THE ISSUE OF BROADBAND APPLICATION AND NETWORK DEPLOYMENT	14
INVESTMENT IN BROADBAND TECHNOLOGIES APPEARS TO BE OCCURRING UNEVENLY AND WITHOUT REGARD TO MARKET DEMAND	14
THE APT PETITION WOULD CREATE INDUSTRIAL POLICY THAT PICKS WINNERS AND LOSERS – TRANSFERRING INVESTMENT FROM ONE GROUP OF FIRMS TO ANOTHER WITHOUT REGARD FOR OVERALL OR OPTIMAL INVESTMENT	14
NEW ENTRANTS FACE A NUMBER OF REGULATORY HURDLES IN DEPLOYING BROADBAND NETWORKS THAT ARE NOT ADDRESSED BY THE APT PETITION. THESE ISSUES MUST BE ADDRESSED IF THE COMMISSION SEEKS TO OPTIMIZE BROADBAND INVESTMENT.....	15
THE APT PETITION RAISES SOME VALID POINTS THAT DEMAND FURTHER REVIEW AND CONSIDERATION IN A CARRIER-NEUTRAL, TECHNOLOGY-NEUTRAL PROCEEDING.....	15
CONCLUSIONS.....	17

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Implement Section 706 of the 1996)	
Telecommunications Act)	

The Economic Strategy Institute (ESI) hereby opposes the Alliance for Public Technology's (APT) request for a Notice of Inquiry (NOI) and Notice of Proposed Rulemaking (NPRM) to implement Section 706 of the Telecommunications Act of 1996 ("Act").

Summary and Introduction

The Commission should deny the request by the Alliance for Public Technology for a NOI and NPRM and should consider a broader, more encompassing NOI on the subject as soon as possible. ESI commends APT for raising the issue before the Commission in its request for NOI and NPRM. While ESI believes the Commission must address the issue of promoting broadband applications, in order to promote the American economy, we believe that the APT petition would neither serve the public interest nor meet the goals and statutory requirements of Section 706 of the Telecommunications Act of 1996.

The Economic Strategy Institute was founded in 1989 to develop and promote a comprehensive economic strategy for American economic leadership in the twenty-first century. ESI realizes that telecommunications and information policy is of crucial importance to the future health and continued prosperity of the American economy. The ESI Advanced Telecom and Information Technology Program (atitp@ESI) is dedicated to the formulation of sound national, international and global public policies for telecom and

information technology industries. ATITP researches and espouses policies that support high growth rates, advancing productivity, stable prices, high rates of job formation, and maintenance of America's global technological leadership and competitiveness.

The future of the telecom and the information-technology industries, with all the promise they hold for America's global competitiveness, is threatened at times by overzealous, or sometimes absent, government regulations and policies. What regulators do, and what they do not do, over the next ten years in telecommunications and information technology sectors will have a demonstrable and sizable impact on U.S. employment and competitiveness, as well as on America's position in the global economy.

ESI believes that broadband investment policy is the single most important issue before the Commission, and one of the most important policy determinants of America's future economic growth.

Investment in telecoms, particularly broadband applications, has a demonstrable impact on the productivity and competitiveness of the U.S. economy. Not only do these applications offer a tremendous opportunity for incumbent, competitive and future telecom service providers, these are indispensable to the revenue, job, export, and productivity growth to an increasing number of industries. Broadband networks and applications are the foundation upon which much of the country's economic growth depends. In addition, new industries and applications will only succeed in an environment where broadband capabilities are both pervasive and affordable.

These linkages between overall economic growth and investment policy within the telecom industry is the overriding reason for ESI's interest in supporting action on this issue as soon as possible.

Despite the need for speedy broadband deployment, ESI believes that taking action based on the APT petition would be contrary and detrimental to the goal of optimizing the speed, level, and composition of investment in this sector.

The petition is fundamentally flawed in the following ways:

1. The petition focuses exclusively on promoting ILEC investment with disregard for investment by all existing and future players. The focus of the APT petition is not on optimizing broadband investment, but on maximizing ILEC broadband investment without regard for total investment or efficient investment.

2. The petition heavily discounts investment by new and future entrants. Speaking generally, competition is a prime driver of investment – both overall investment and investment decisions by incumbents. The APT petition would initiate a repeal of competition policies, *in toto*, in favor of an ILEC-only industrial policy that disregards competition.
3. The petition ignores other platforms for broadband service delivery. Wireless, broadcast, cable, and satellite providers are also preparing to enter the market for broadband capabilities and services. Any proceeding that seeks to speed broadband network and application deployment must review and consider the regulations that may be hindering deployment via these platforms.

Section 706 correctly recognizes the importance of broadband investment, and the Commission should move seriously and forthrightly to address the issues raised in the petitions. The Commission's infrastructure policies must be designed to optimize the total amount of investment by entrants and incumbents. A Section 706 proceeding that focused solely on the issues APT raises would seek to close the local telephone network to competition for broadband services, just as the cable network today is closed. Because competitive entry is a key to overall investment, we believe the Commission must examine the problems new entrants face in competing with incumbents for broadband service delivery, in addition to any disincentives incumbents may face regulatory policy.

ESI does not contend that all of the issues raised in the APT petition are without merit. On the contrary, the Commission should review many of the policies raised by APT and assess their impact on investment levels. However, pursuit of these issues alone, and without regard for either competition policy (or overall and composite investment levels), would be contrary to the public interest and may lead to stronger monopolies and less overall investment and innovation. Reviewing only the issues raised by APT would create an environment in which the incumbent local exchange companies could leverage their monopoly in local telephony into data communications, including the competitive ISP business.

We emphasize that pursuit of competition policy alone does not satisfy the statutory requirement that the Commission encourage infrastructure investment and innovation. Competition policy is necessary, but not sufficient, to ensure optimal investment and innovation. Many other policies may affect investment decisions by incumbents and new entrants, and these policies

deserve review and scrutiny. In addition, competition policies may go so far as to discourage investment by one set of players in favor of investment by another.

In our opinion, Section 706 was designed to be a technology-neutral, company-neutral examination of the deployment of broadband applications. This suggests an inquiry into how new and incumbent entrants are deploying on all platforms: cable, broadcast, telephone, satellite, and terrestrial wireless. Given the limited scope of the APT petition, as well as its disregard for competition policy and other goals of the Telecommunications Act of 1996, we believe this petition should be denied in favor of a more broadly focused Notice of Inquiry and Notice of Proposed Rulemaking that truly serves to maximize the speed of optimum investment in broadband services.

The Importance of Broadband Technologies

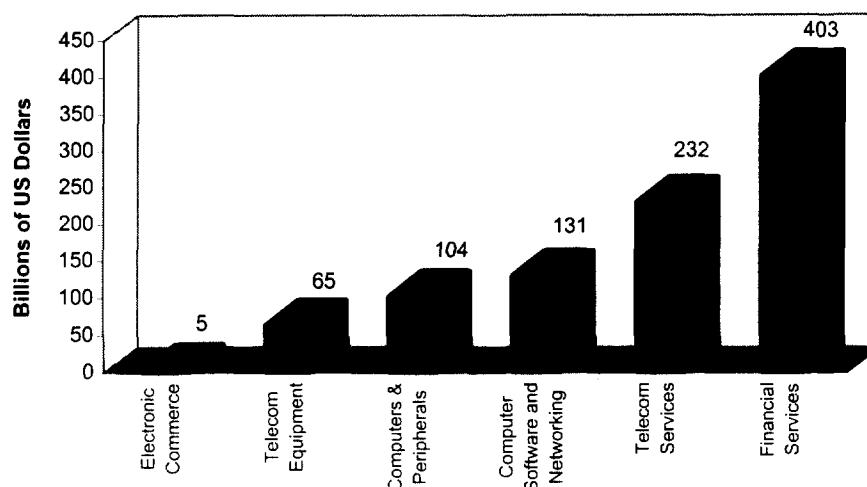
Not only do broadband technologies promise to reshape the telecom and information technology ("IT") industries, but they also provide the foundation for some of America's fastest growing and most promising sectors. Perhaps no other infrastructure is as important to the long-term growth and prosperity of the United States as the Internet.¹ Not only is that sector growing at a rapid pace, the Internet is also fostering growth and productivity in existing industries, as well as entirely new industries. Its growth and proliferation has the potential to impact every sector of the American economy, from apple farming to semiconductor production.

The Internet is becoming a significant driver of economic growth and prosperity in the United States. It is becoming an important part of the foundation for all communications and information technology industries. Computer, semiconductor, telephone service, and network equipment sales are increasingly driven by the use and proliferation of the Internet. As more Americans go "online," as more corporations link their facilities via computer networks and communications, and as more transactions are performed electronically, these sectors grow in tandem.

These industries generated more than \$938 billion in revenue in 1997, as illustrated in the following graph:

¹ The Internet is being referred to generally to include all data networks (the Internet, Intranets, Extranets, etc.).

Industries That Increasingly Rely on the Internet for Continued Growth



Source: U.S. Department of Labor, Federal Communications Commission, and U.S. Department of Commerce.

Moreover, each of these industries is growing faster than the national GDP. The computer networking industry continues to grow at 29.6 percent, making it the fastest-growing manufacturing sector in the country.² Telecom equipment and computer manufacturing are also among the top-ten fastest-growing manufacturing industries. The 1998 forecast for the growth rates of these industries is shown in the chart that follows:

The Internet is an Important Growth Element of America's Fastest Growth Industries

Industry	1998 Forecast Growth Rate
Electronic Commerce	500%
Computer Software and Networking	29.6%
Computers & Peripherals	14.0%
Telecom Equipment	8.0%
Telecom Services	5.4%
Financial Services	4.1%
OVERALL ECONOMY	2.8%

² U.S. Industry Outlook 1988.

Source: U.S. Industry Outlook 1998

The Internet is also spurring entirely new industries that could be America's growth engines over the next twenty years. Three industries are particularly exciting: electronic commerce, telemedicine, and distance learning.

Electronic commerce, known as e-commerce, is the marketing, sales, and delivery of goods and services via a network of interconnected computers. Influencing nearly every arena of business by facilitating interaction among consumers, governments and businesses, e-commerce enables business to provide information, products, and a wide variety of new and existing services to customers, facilitates electronic payment between consumers and business, and provides a medium for advertising and name-brand creation.

The market for electronic commerce is still in its nascent stages, generating less than \$2 billion in 1996³, but most analysts are forecasting spectacular growth rates⁴, as businesses learn to take advantage of these systems.

Broadband data networks are also a tremendous tool for increasing productivity and generating cost savings. By helping firms manage their inventories better, and by increasing coordination between factories in the United States and points overseas, the Internet has the potential to increase U.S. efficiency by driving down the cost of doing business. Improvements in inventory management via networks could save U.S. manufacturers more than \$103 billion per year. Those savings mean lower prices for U.S. consumers, greater exports for U.S. firms, and more jobs for U.S. workers.

The Internet is expected to be the single largest jobs creator in the U.S. economy from 1998-2005.⁵ If the Internet is unfettered, and economic conditions remain the same, the U.S. economy could create as many as four million jobs in new and existing industries over that time period.

If the Internet develops as expected by analysts, the United States economy will experience growth in gross national product (GNP).⁶ In all, it is possible that our economy will grow an additional \$721 billion from 1998-2005,

³ See E. Olbeter and C. Hamilton, "Finding the Key", at 11 (Mar. 1998).

⁴ Electronic commerce had a 1998 forecast growth rate of 500 percent. See, U.S. Industry Outlook 1998.

⁵ See R. Cohen "An Economic Model of Future Changes in the U.S. Communications and Media Industries" (May 1997).

⁶ Ibid., at 8-9.

as a direct result of the growth of the Internet, as well as the new industries it fosters and the industries that rely on the Internet for growth.

However exciting the potential of the Internet and other data networks to transform and energize our economy, this potential will never be realized in a narrowband environment. The proliferation of broadband technologies is essential for ensuring continued growth in each of the Internet-dependent sectors listed above. Moreover, most of the high-demand applications now being envisioned for ecommerce will not function in a narrowband environment.⁷

It would be wrong to suggest that the Commission's actions on Section 706 would forestall all of the benefits of this age. However, we firmly believe that the Commission's actions have a meaningful and discernible impact on investment levels.

⁷See e.g. the Conference Proceedings to "America's Broadband Future" at the ANA Hotel, Washington DC (Mar. 1998), submitted as Attachment 1.

The Commission's policies do impact investment decisions and the Commission must take action to spur investment in broadband networks and applications

Commission rules impact incentives to innovate and invest. These incentives affect the level and composition of investment in the telecom sector, as well as the sectors that rely on telecommunications as their core delivery medium. The level/composition of investment in the telecom sector also impacts the value of investment and assets and incentives to invest in closely related sectors that:

- i) provide goods and services to the telecom sector, and
- ii) use telecom networks as complementary inputs. These sectors include producers of computers, computer components, software, online services, information services, data network, and telecommunications equipment and electronic commerce.

On March 3, ESI held a conference, *America's Broadband Future*, to explore the potential impact and current development of broadband applications and networks.⁸ This conference brought together members of the information technology community, telecom service providers, and representatives from Wall Street.

The diverse range of speakers disagreed on many key regulatory matters: Would changes to existing competition policy lead to optimal levels of investment in broadband? How would the uncertainty over these changes affect near-term, middle-term, and long-term investment plans/strategies? What other things (outside forbearance of competition policy) should the Commission consider doing?

Surprisingly, there was also agreement on a number of fundamental points and principles that ESI believes should serve as the foundation for an NOI on Section 706. A synopsis of these points is provided below.

1. Broadband technologies and applications are the key to success of numerous information technology industries in the United States. Many participants from the IT community identified broadband investment as the single most important determinant of their mid to

⁸ The conference proceedings from this conference have been submitted as part of the commentary in this case.

long-term future prospects.

2. While there has been and continues to be increasing investment in advanced broadband applications and facilities on many platforms, the speed of this development has been disappointing and not in line with demand seen in the markets. Latent demand was specifically identified by a number of speakers and, panelists agreed that the latent demand would continue to grow over the next five years.
3. There are a variety of technologies and platforms that are planning to deliver broadband applications to residents and consumers. Companies pursuing market entry strategies via these networks face a different set of technology, financial, business, and regulatory hurdles to reach their goal. Participants identified a set of wireless (third generation cellular, LMDS, satellite), telco, and cable regulatory policies that deterred investment. Barriers to entry as well as barriers to investment in all of these sectors must be reviewed in order to optimize investment in broadband applications.
4. The main problem associated with offering broadband services remains the local exchange, and in particular, the local loop. New and prospective broadband service providers and network builders discussed their intentions to target "the last mile" for investment and improvement.
5. The panel of investors were in general agreement that sound market and business fundamentals remain the primary driver of Wall Street investment. FCC policies have a meaningful impact on overall and individual company investment levels. Regulatory uncertainty (the courts, etc.) also affects the ability of firms to raise capital from financial markets. The longer uncertainty remains, the longer investors remain hesitant to invest.
6. Open and competitive market entry has always been and will be the cornerstone of investment decisions and innovation among both entrants and incumbents. However, there are other policy tools that could supplement investment policy.
7. There is simply not enough information available to determine how current policy tools are impacting investment levels. Nor is there enough information to construct a detailed picture of the level and composition of investment by incumbents. There was general agreement that the FCC needs to collect more and better data on

investment levels and composition.

8. The Federal Communications Commission is in a unique position to impact the deployment of advanced broadband applications. While States will play a key role in this process, the Commission must take the lead in advancing an agenda to promote speedy deployment of these systems.

Specific Comments on the APT Petition and the Issue of Broadband Application and Network Deployment

Investment in broadband technologies appears to be occurring unevenly and without regard to market demand

Alliance for Public Technology poses a fundamental question in their filing: Is investment occurring at a reasonable rate? A "yes" or "no" answer is not sufficient grounds for determining policy. The composition of investment is crucial, particularly as it pertains to Section 706's reference to "all Americans". Anecdotal evidence suggests that new entrants are investing heavily in facilities for large and medium-sized business customers. While analyst reports quote CLEC access lines at 510,335 as of September 1997, ESI can find no verifiable data detailing the number of xDSL lines being offered. xDSL is being offered on a competitive basis by a handful of new entrants, and there is some competition arising for T1 services. However, there is no supporting data on the availability of broadband technologies to residential consumers – a key missing data point for this analysis.

The APT petition would create industrial policy that picks winners and losers – transferring investment from one group of firms to another without regard for overall or optimal investment

APT says that it is "very poor policy" to rely on the CLECs to accelerate deployment of advanced capabilities, and then focuses solely on policies that would seek to maximize investment by ILECs. ESI believes that it is very poor policy to construct favorable investment rules for any single groups of firms. The Commission should not attempt to pick winners and losers in the broadband applications market. The forbearance of competition policy that APT seeks would essentially pick the ILECs as national champions at the expense of new entrants. Moreover, the loosening of restraints in the telco sector may have a dampening effect on broadband investment by firms in different sectors (wireless, for example).

New competitors are attempting to enter the market to provide these services, and for the foreseeable future their ability to enter and compete on a level playing field will be dependent on government regulations (i.e. competition policy). Broadband investment by new entrants in different sectors (whether they are CLECs, wireless providers, or satellite companies) is a crucial part of the entire investment picture. Throughout the history of this industry, technological innovation has spurred deployment of advanced systems. The two major shifts

in AT&T's long distance network have occurred directly after the establishment of a competitive, more advanced system. In 1988, AT&T took the single largest write-off in history to upgrade its analog network to digital. The accounting write-off of almost \$6.7 billion in long distance network equipment, precipitated by Sprint's "Pin Drop", was not something AT&T would have done of its own accord. Today, AT&T is again rapidly revamping its long distance network to compete with newcomer Qwest and others. This same pattern would emerge in the local market if competition existed for information and Internet access.

New entrants face a number of regulatory hurdles in deploying broadband networks that are not addressed by the APT petition. These issues must be addressed if the Commission seeks to optimize broadband investment.

There are a number of enforcement, legal, and regulatory policies that clearly are delaying the deployment of broadband systems and must be addressed in any proceeding on broadband investment. The failure to enforce FCC rules and the Act itself has made it difficult for new entrants to compete. The Commission should examine the problems new entrants face, including: implementing rules regarding: collocation; standards; costs of "line clearing"; one-time charges; and additional collocation and unbundling requirements within the local loop, and the possibility for standardization of points within the local loop. The Commission should initiate a proceeding to find a technical and regulatory solution to ISP collocation problems that permits ISPs and OSPs access to the same advanced services as the ILECs provide their own affiliates.

The APT petition raises some valid points that demand further review and consideration in a carrier-neutral, technology-neutral proceeding

The Commission should also examine existing rules on the ILECs such as price cap and depreciation regulation. The literature on price caps is inconclusive, and the Commission should explore its relation to investment, given the implementation of the Act and various state activities. There may be depreciation regulations that deserve review. To the extent that current pricing regulations on telephone plant assume market characteristics that are not true in the market for broadband services, these regulations should be reviewed.

Regardless of the validity of the claim that the FCC lacks statutory authority to relieve Section 271 and 251(c), ESI believes that UNEs should remain in force and pose little threat to the incumbents ability to introduce new services. It is also essential that ILECs resell their advanced broadband services

to ISPs and other providers. Else, monopoly power in the local exchange may be leveraged against firms in the competitive ISP and OSP markets.

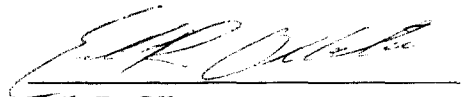
Removal of unbundling requirements would close access to ILEC networks and foreclose competitive investment for broadband investment. This outcome would be contrary to the Commission's stated competition policy as well as the purpose of Section 706 of the Act.

At the same time, it is undeniable that the pricing of these network elements will determine the investment level and composition of incumbents. At the same time, the fact that advanced broadband network elements are fungible (i.e., will be employed to provide plain-old-telephone-service) raises a host of questions that must be carefully considered before any action is taken.

Conclusions

For these reasons, the Commission should deny Alliance for Public Technology's petition. At the same time the Commission should quickly move forward with a Notice of Inquiry to facilitates broadband investment in a carrier-neutral, technology-neutral, pro-competitive manner.

Respectfully submitted,



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America's Broadband Future

Conference Proceedings

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Table Of Contents

SUSAN NESS, FEDERAL COMMUNICATIONS COMMISSION	3
ERIK R. OLBETER, ECONOMIC STRATEGY INSTITUTE	9
PANEL I: IMPACTS OF BROADBAND INVESTMENT ON HIGH-TECH INDUSTRIES	13
Bob Collet, Teleglobe	14
John Giere, Ericsson	19
Timothy Stone, Motorola	21
Tom Cohen, Davidson and Cohen	23
PANEL II: DELIVERING BROADBAND SERVICES TO THE HOME -- A SUPPLIER'S PERSPECTIVE	29
Shant Hovnanian, CellularVision	30
Elwood Kerkeslager, AT&T	33
Tom Tauke, Bell Atlantic	35
George Vradenburg, America Online	37
DUANE ACKERMAN, BELLSOUTH	41
HAROLD W. FURCHTGOTT-ROTH, COMMISSIONER, FEDERAL COMMUNICATIONS COMMISSION	47

2• *America's Broadband Future Conference. March 3, 1998*

Susan Ness, Federal Communications Commission

MS. NESS: Good morning. Let me get started by telling you, first of all, that I did not pick the title for this speech. As for why investment matters, that is a no-brainer. If we want more and better telecommunications and information services for businesses and residential customers, someone has to put up the money to develop and deploy those services. We can not have infrastructure or innovation without investment. We do not need an MBA to tell us that investment matters, so let us all agree that investment matters, and move on.

Let us talk instead about what kind of investment is desirable, and what should be the government's role in promoting desirable investment.

Guess what? Government and industry long ago devised a regime that ensures plenty of investment: create a monopoly and give the monopolist a guaranteed rate of return that exceeds the real cost of capital. Such a regime assuredly promotes investment. Attracting capital is never a problem, but it does not do much for either innovation or efficiency.

Thirty years ago, this nation began a grand experiment with a different approach, when the FCC began to allow the first seeds of competition to be sown in long distance and in customer premises equipment. Investors and entrepreneurs seized the opportunity. In the 1970s, the first seeds had sprouted and taken root, and competition had begun to take over. The FCC and the courts continued to make adjustments, and opportunities for competitive investment were expanded. New products and services began to flourish.

Now, it is not my goal today to recount this history in any great detail. Suffice it to say that there has been a long evolution of national telecommunications policy that has steadily increased opportunities for competition, and American consumers have reaped enormous benefits from that competition.

Throughout the course of the policy debates over the past twenty-plus years, there have been those who have defended the status quo. Defenders have said that new policies of competition would be disruptive, would lead to cream skimming, would threaten universal service, and would jeopardize continued investment by the incumbents who had served this nation so well.

The passage of the Telecommunications Act of 1996 represented the ultimate repudiation of that point of view. Congress, in passing the Act, and the FCC, in implementing it, have agreed on one vital point: the right question is not whether policy promotes investment, but whether it promotes efficient investment and competitive investment. That is what we have been trying to accomplish, and, although there have been some bumps in the road and even some unexpected detours, we now are seeing the signs of the healthy investment that Congress intended.

Let me give you a couple of examples. CLECs have raised about fifteen billion dollars over the past two years to construct and operate local exchange facilities. Now, two things about this are noteworthy. First, it is not just in Chicago and New York. We are also seeing entrants with strategies focused on second- and even third-tier markets.

Second, while many of the entrants have targeted business customers, we are also hearing welcome news about companies that think there is money to be made by deploying fiber to residential neighborhoods, for telephone, video and Internet service. Cable has shaken off the doldrums. In the wake of massive upgrades of cable plants, now and over the past couple of years, the leading cable operators are beginning to deploy cable modem services. Cox, CableVision, Media One, are some of those who are rolling out telephony and Internet access to a growing number of subscribers. New companies like Quest and Level Three are investing multi-billions of dollars into the deployment of new fiber capacity. They will be offering new Internet services, including voice telephony. UUNet, which is not part of MFS, reported at one point that it was doubling Internet backbone capacity every four months.

In wireless, we have seen a variety of large and small companies pay many billions of dollars at PCS spectrum auctions and commit many billions more to build up their licensed areas. They have spurred cellular providers to accelerate their conversion to digital, and they are all now looking at third-generation systems and opportunities. Also in the wireless arena, companies such as MetroComm are taking advantage of unlicensed spectrum to offer wireless Internet services. Solnet is using a licensed spectrum to read utility meters for millions of homes, with back orders for two million more. Teligent is using microwave to offer broadband bandwidth to medium-sized businesses. Our LMDS auction, which is ongoing today, will assign a vast swaths of spectrum that could be a future platform for broadband services.

Digital television will be launched this fall in major markets across the country, giving consumers not just pictures with astounding clarity, but also blanketing the region with astounding bandwidth, which will provide a host of digital data services.

Satellite projects, once in the distant future, are now on the horizon, so to speak. Iridium was a bold gamble several years ago but, with fifty-plus satellites now in orbit, the vision appears to be paying off. Telidesic, Celestri, and Skybridge propose to compete in the provision of broadband communications and Internet connectivity on a global basis. I have seen reports that estimate a total system cost for these second-generation systems at close to fifteen billion dollars. Third generation systems are expected to come in at a whopping thirty-five billion.

Meanwhile, investment among established telcos is apparently not only unabated, but increasing. The largest companies, the five RBOCs and GTE, invested \$24 billion in 1996 and \$26.3 billion in 1997 to maintain and enhance their domestic networks. High-single-digit growth rates before the passage of the telecom act have now swelled to the mid teens.

That is not all. It is just a small sampling of what is happening with the communications infrastructure in the United States.

At the same time, we are seeing progress in the development of distribution technologies. ADSL, HDSL, and DSL light, for example, in the development of services that ride atop these technologies. The FCC tends to think in terms of development of the physical

layout, but we also need to take account of all the wondrous things that are happening, as my friend, Dale Hatfield, says, up the stack – that is, the growth of the Internet contact providers, and the accelerating progress of electronic commerce.

As you can tell, I am absolutely delighted by all these developments. While it has become fashionable to complain that the Telecommunications Act has not yet brought about all the developments that were contemplated, we are, in fact, off to a pretty good start, all things considered.

Now, what do I mean by those last few words? Well, for one thing, some of the expectations associated with the telecom act were unrealistic: not the expectations of what would ultimately happen but, rather, the expectations of how long it would take. Telecommunications is an infrastructure business, like railroads, and highways, and electricity. Building infrastructure takes time. Two years after the interstate highway act, you could not drive sixty miles an hour from Portland, Oregon, to Portland, Maine. Why should telecommunications be any faster?

Also, by the way, we have to deal with an additional problem in telecommunications. The builders of the interstate highway system did not face entrenched monopolies that controlled the local access rates.

That is why I have been pleased that the financial markets have been ready to supply not just capital, but to supply patient capital to some of the new entrants. One chairman who raised about a billion dollars told me that he had done so with the expressed understanding that his company would lose money for about at least the first four years. That gives him some time to get his infrastructure built and extended to where the target customers are.

To transform the local telephone marketplace from monopoly to competition takes time. Congress clearly hoped that the new entrants would construct their own infrastructure over time, using the cable plant, wireless local loop, or even partnerships with electric utilities, but Congress also sought to jump-start competition by allowing strategies other than full-scale replication of the incumbent's networks for local market entry.

So, Congress required incumbents to open their markets to competition though the vehicles of resale and unbundled network elements. Resale has the virtue of being quick and easy. At least those are the supposed virtues. The incumbent service is priced for resale by subtracting out the incumbent's avoided market expense. Of course, the new entrant has its own marketing expense, so the profit potential is pretty negligible, but the approach does, or should, give the new entrant a fast way to enter the local market. It also gives the consumer an opportunity to obtain a bundle of services, such as local or long distance, by dealing with a single supplier. Moreover, the reseller has some flexibility for different pricing packages and for targeting market segments that might be overlooked by the large suppliers. Under this approach, the incumbent maintains its full measure of profit. For the new entrant, the strategy will ordinarily make sense only as a transitional matter.

That is where the UNEs come in, or, at least, they were supposed to. The new law created additional entry vehicles that are considered more normal, known as Unbundled Network Elements, or UNEs, that allow new entrants to purchase the piece parts of the incumbent's network. They can buy all of the pieces necessary to provide a service, or just buy those pieces that they need and provide the rest on their own.

The key here is getting the pricing right. Wrong economic signals to a would-be competitor would deter it from constructing its own facilities. The FCC spent an awful lot of time thinking about pricing issues when it wrote its local competition letter in the summer of 1996. We listened hard to what the incumbents had to say, what the new entrants told us, as well as to what Wall Street and our own economists thought about the topic. The statute said that UNE should be priced on the basis of cost. To give the right economic signal, every reputable economist told us, required that we interpret the term "cost" to mean future cost. A new entrant confronting a bill to buy or put decision should be making that decision based on the assessment of whether it is more likely to be an efficient provider, not on the basis of how much of the depreciated investment happens to be on the incumbent's books of account.

We also considered the question of whether the price for UNEs should include a contribution to the incumbent's joint, common cost and whether it should also include a risk adjustment cost of capital. We said yes on both parts. Why? Because we wanted to send the right economic signals to the new entrants and to incumbents alike. We did not want to deter facilities-based investment by the new entrants, or deter innovation by the incumbents.

Yet another issue was the question of whether the UNE crisis should be geographically de-averaged. Generally speaking, it costs less to construct local-loop facilities in urban areas, somewhat more to construct them in suburban areas, and still more, sometimes a lot more, to construct them in sparsely populated areas. As long as telephone rates are set on the basis of average cost, allowing UNE prices to be averaged as well would tend artificially to depress for UNE in urban areas and to stimulate it in rural areas, with a distorting effect on investment decisions. So, we told the states that the rate they set and arbitrated into connection agreements should be de-averaged. We thought our role was to establish the principles for construing the statute, leaving the specific setting of rates to the state public utility commissions. They are best able to take into account the local market conditions, no question about that.

As most of you probably know, the court of appeals and the eighth circuit court decided that we had overstepped our authority even to be establishing pricing principles. The bad news is that, as a result of that decision, each of the state commissions is free to formulate its own notion of what the term "cost" means, subject to review in ninety-plus U.S. district courts. The good news is that, even before the Supreme Court agreed to hear the Eighth Circuit's decision, most of the courts considered the same economic principles that we did, and they reached the same general conclusions about the importance of sending correct economic signals. Most states saw the potential harm to competition of discouraging efficient investment or encouraging inefficient investment. There is a long road ahead in the courts and in the state commissions before the final prices are set for UNE interconnection and for resold services, but there is a much higher awareness than in the past of the importance of addressing these issues in an economically rational manner.

Similar considerations apply in the case of universal service subsidies. Today, most subsidies are implicit. Rates in high-cost areas are kept low because a variety of other services appraised well in excess of cost. That is not sustainable in a competitive marketplace. One of the top priorities at the FCC and at the state commissions will be to devise a new system of